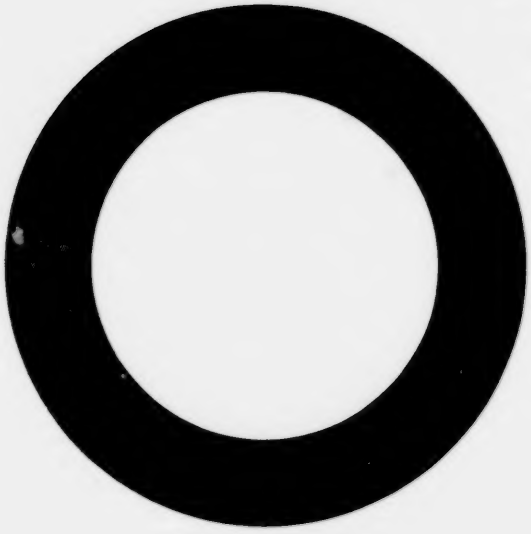

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DEVELOPMENT AND TRANSFER OF TECHNOLOGIES

STATUS OF THE CONSULTATIVE PROCESS (DECISION 4/CP.4)

Report of the Latin America and the Caribbean regional workshop on the transfer of technology consultative process San Salvador, El Salvador, 29-31 March 2000

Note by the Chairman

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I. INTRODUCTION

A. Mandate

1. By its decision 4/CP.4, the Conference of the Parties (COP) requested the Chairman of the Subsidiary Body for Scientific and Technological Advice (SBSTA) to establish a consultative process to consider the list of issues and questions contained in the annex to that decision, as well as any additional issues and questions subsequently identified by Parties, and to make recommendations on how they should be addressed in order to achieve agreement on a framework for meaningful and effective actions to enhance implementation of Article 4.5 of the Convention (FCCC/CP/1998/16/Add.1).

2. At its tenth session, the SBSTA endorsed the proposal by the Chairman that the secretariat organize three regional workshops, one in Africa, one in Asia and the Pacific Islands, and one in Latin America and the Caribbean. It invited the Chairman, with the assistance of the secretariat, to complete the regional workshops by early 2000, and to report to the SBSTA at its twelfth session, with a view to taking a decision by COP 6 (FCCC/SBSTA/1999/6, para. 69 (c) and (d)).

B. Scope of the note

3. The Latin America and the Caribbean regional workshop on the transfer of technology consultative process was organized by the secretariat with the kind assistance of the Government of El Salvador. The workshop was held in San Salvador, El Salvador, from 29 to 31 March 2000.

4. This note presents a report on the workshop. The report takes into account information and ideas presented in the country papers, workshop presentations, and panel discussions, and the outcome of the three parallel working groups.

5. Throughout the workshop, and particularly in the parallel working groups, the participants suggested elements of a framework for meaningful and effective actions to enhance the implementation of Article 4.5 of the Convention. As these preliminary ideas emerged, the Chairman did not attempt to hold a debate or to reach agreement among participants on the appropriateness, practicability or acceptability of these ideas or on how such ideas relate to a framework. With this understanding, the suggested possible elements of a framework contained in this report are initial ideas that can serve as input to further discussions in the consultative process.

6. A seminar organized by the Climate Technology Initiative (CTI) in cooperation with the UNFCCC secretariat was held back-to-back with the UNFCCC workshop from 27 to 28 March 2000. The objectives of the CTI seminar were to enhance the understanding of the role of the private sector in the diffusion of environmentally-sound technologies, know-how

and practices ("ESTs") in the Latin America and the Caribbean region and to report the findings to the UNFCCC consultative process. The report of this seminar is contained in the annex to this note.

7. This note should be read in conjunction with the report of the African regional workshop held in Arusha, United Republic of Tanzania, from 16 to 18 August 1999 (FCCC/SBSTA/1999/11), the report of the Asia and the Pacific regional workshop organized in Cebu, the Philippines from 17 to 19 January 2000 (FCCC/SBSTA/2000/INF.2), and the Chairman's note on possible elements of a framework for meaningful and effective actions to enhace the implementation of Article 4.5 of the Convention (FCCC/SBSTA/2000/4).

II. REPORT OF THE LATIN AMERICA AND THE CARIBBEAN REGIONAL WORKSHOP ON THE TRANSFER OF TECHNOLOGY CONSULTATIVE PROCESS

A. Introduction

8. Representatives of Parties attending the workshop had the opportunity to provide information in the form of a "country paper".[1] These papers provide detailed country information on issues related to the transfer of technology including: technology needs, technology transfer activities, actions and programmes for technology transfer, and possible elements of a framework for meaningful and effective action.

9. The Chairman of the SBSTA and Parties from the Latin America and the Caribbean region developed the workshop agenda to address regional concerns related to the transfer of technology, and the issues and questions contained in the annex to decision 4/CP.4, and to follow up on progress made at the African regional workshop and the Asia and the Pacific regional workshop on elements of a framework for meaningful and effective actions to enhance implementation of Article 4.5 of the Convention. A significant part of the agenda was devoted to three small parallel working group discussions which were given the task of developing ideas on a framework, relevant to the Latin America and the Caribbean region, for meaningful and effective actions to enhance implementation of Article 4.5.

10. The workshop was attended by 84 participants, including 47 from non-Annex I Parties, representing Latin America and the Caribbean (42), Africa (2), and Asia (3). Nineteen participants were from Annex I Parties. Twelve intergovernmental organizations were represented and six non-governmental organizations (NGOs). Of the 84 participants, 14 were from the private sector.

11. The objectives of the workshop were to generate and share information on the situations and needs of countries in the Latin America and the Caribbean region and, in particular, to advance the consultative process by discussing possible elements of a framework for meaningful

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[1] The country papers are available on the UNFCCC web site (from www.unfccc.de, select "Programs", then "Technology", then select the country papers under the Latin America and the Caribbean regional workshop).

and effective actions to enhance the implementation of Article 4.5 of the Convention. Consequently the workshop focused on:

- The exchange of information and ideas among participants on issues, opportunities, barriers, needs and concerns relating to the transfer of environmentally-sound technologies, particularly to the Latin America and the Caribbean region;

- Presentation and discussion of the Intergovernmental Panel on Climate Change (IPCC) Special Report on Methodological and Technological Issues in Technology Transfer;

- Consideration of multilateral initiatives to enhance the transfer of environmentally-sound technologies in Latin America and the Caribbean;

- Ways and means of improving the transfer of environmentally-sound technologies and know-how under the Convention, considering perspectives from governments, intergovernmental organizations, non-governmental organizations and the private sector;

- Consideration of preliminary designs for the UNFCCC technology web site including a pilot activity to develop a technology inventory; and

- Possible elements of a framework for meaningful and effective actions to enhance implementation of Article 4.5 of the Convention.

12. The workshop participants recognized the diversity among countries of the Latin America and the Caribbean region in terms of environmental, geographic, economic and social characteristics and noted that sustainable technology transfer approaches would need to take into account these differences. Due to these differences, priorities for technology transfer and technical assistance and views on how these may best be provided under the Convention varied between countries.

13. The workshop discussions addressed questions related to "how" technology transfer under the Convention could be effectively and sustainably carried out between Parties. The discussions also paid particular attention to the role and function of the private sector in technology transfer for the region.

14. This report summarizes the proceedings of the workshop in five main sections:

- Technology needs and technology needs assessment;

- Technology information;

- Overcoming barriers to the transfer of technology;

- Building capacity for the development and transfer of technology

- Outcome of the working groups: conclusions and suggested possible elements of a framework for meaningful and effective actions to enhance the implementation of Article 4.5 of the Convention.

B. Technology needs and technology needs assessment

15. Few detailed mitigation and adaptation technology needs assessments have been undertaken in the region. Several countries, including Jamaica and the Bahamas, have not yet undertaken assessments of the technical potential for the uptake of ESTs such as renewable energy technologies.

16. Conducting country-based technology needs assessments, including the identification of priority needs and a portfolio of climate actions, is an important initial step to promote and facilitate the transfer of technology. The provision of technical and financial assistance by developed countries is necessary for developing countries to successfully undertake quality needs assessments.

17. Needs assessments should be country-driven, implemented in accord with developing country priorities, reflect local needs and circumstances, and involve multiple stakeholders in a transparent process. They should also include analysis of the social and environmental impacts of ESTs and climate actions. Experience in the region indicates that country-driven technology needs assessment can lead to improved international cooperation.

18. The outcome of a needs assessment should identify a specific and limited number of technology priorities. For countries that have already defined a portfolio of needs and climate actions, the next step involves governments playing a facilitating role among all relevant stakeholders to implement these priority actions.

19. Technology needs assessments are only effective if they are followed up with programmes that respond to identified priority needs. Hence a portfolio of climate actions for mitigation and adaptation technologies should be developed alongside the list of priority technology needs. Such a portfolio of actions could be used to attract financial and technical support from various stakeholders, including bilateral and multilateral donors.

20. Some specific technical suggestions related to the region were made. Within Latin America and the Caribbean, there are a relatively large number of smaller countries with large rural populations lacking access to networked energy supplies. Therefore, priority could be given to sustainable technologies and projects which are economically feasible on a relatively small scale, are not too technologically sophisticated, and which produce demonstrable secondary benefits (e.g. air quality and water improvements).

21. Understanding the applications of indigenous and traditional technologies is a key factor in promoting successful adoption and integration of new technologies.

22. The participants emphasized the importance of adaptation technologies. In particular, the need to consider anticipatory adaptation technologies was discussed and examples relating to the forest and agricultural sectors were given (e.g. the adaptation of new species and new techniques to agriculture).

C. Technology information

23. The central importance of access to, and the dissemination of, technology information was highlighted many times throughout the workshop. Some participants noted that there is limited availability and access to useful information on ESTs in the region. In many countries within the region, a central information focal point does not exist and hence relevant information is scattered among various sources in the public and private sectors.

24. Many participants identified a need to develop a regionally or subregionally based system to collect and distribute information on the transfer of environmentally-sound technology. This system could also be used to communicate prioritized climate technology needs and provide information on financing sources, assistance and technical resources and other subjects such as inventories of regional needs, projects, technologies and activities (including activities related to adaptation to climate change and the social and environmental benefits of implementing ESTs). The information system should be tailored to meet regional and subregional interests and needs and should enhance existing information resources and centres as appropriate.

25. Setting technology transfer related goals was mentioned as one possible way of enhancing communication among all stakeholders in the technology transfer process. Technology needs assessment activities such as the Technology Cooperation Agreements Pilot Project (TCAPP) and Cooperative Technology Implementation Plans (CTIP) are contributing to this process by assisting developing countries to identify their technology priorities and a portfolio of relevant climate actions to facilitate the transfer of these technologies.

26. The current and potential role of the private sector in the transfer of technology was discussed. Private sector representatives suggested that private business could be encouraged to voluntarily report its activities (both success and failure stories) related to technology transfer. In addition, the issue of whether some form of specific international standard (similar to ISO standards) related to technology transfer might be a useful tool to increase demand for ESTs was discussed. A further suggestion was that companies could be encouraged to assist in the building of technology information networks to foster greater networking among all stakeholders but especially educational and research institutions.

D. Overcoming barriers to the transfer of technology

27. Many barriers, as well as suggestions for overcoming them, were discussed during the workshop. The summary of these discussions is arranged according to the different categories of barriers contained in document FCCC/TP/1998/1.

1. Institutional barriers

28. The issue of inappropriate or restrictive business practices was suggested as a barrier to the transfer of environmentally-sound technologies to some developing countries. An example of an inappropriate practice could be the transfer of outdated technology from developed to developing countries. While the impetus for such practices can be linked to inappropriate market signals and inadequate enabling environments, overcoming these barriers involves reexamining policy frameworks in both developed and developing countries to discourage such practices.

29. The lack of commercial entities such as business councils and NGOs at the rural level is a barrier to information flow and issue awareness in rural areas. These organizations often act as catalysts in raising awareness and providing technical assistance and training to establish, for example, micro-entities that sell and finance renewable energy technologies. The limited participation of NGOs in technology transfer is due to the lack of understanding of the role of NGOs, lack of expertise in this field and in some instances, their dependence on international funding which is generally not directed towards providing assistance on technology transfer.

30. Another important barrier is the poor level of national coordination of technology transfer activities within developed and developing countries, which leads to a disjointed effort in this area with redundant and often conflicting implementing activities. One possible way of overcoming this could be the identification or establishment of focal points for activities related to the development and transfer of ESTs in both developed and developing countries. In addition the involvement of local experts and institutions as well as community participation, can enhance successful technology transfer and adoption.

2. Political barriers

31. Sustainable development goals, including the development and transfer of environmentally-sound technologies and know-how, are part of a wider portfolio of goals and priorities which policy makers pursue and which includes various social and economic development goals. It was noted by one participant that initiatives in support of climate change objectives are often perceived as a passing phase, and hence given lower priority despite their other potential environmental and social benefits. As a result, the synergies between climate change initiatives and development are frequently not recognized and in many instances, developing and developed countries alike could benefit from increased capacity and awareness building among key policy makers on this issue.

32. The private sector views technology transfer as part of good business practice and believes that policies to facilitate and encourage the enhancement of these activities by the private sector are needed. As policy makers generally associate technological development and innovation with economic development, linking these with actions that could facilitate activities undertaken by the private sector is a logical next step for policy makers.

33. To address these political barriers, an improved understanding of the activities and function of stakeholders and the effectiveness of technology transfer for meeting climate change

and development goals is needed on the part of many policy makers in developing countries. Possible ways to address this could be to include mitigation and adaptation technology transfer strategies in national development plans and to provide assistance to better report on technology needs within national communications. It was also suggested that a separate process for reporting technology transfer needs beyond the national communication process would assist in building political support for identified technology needs, goals and strategies.

3. Technological barriers

34. Effective technology transfer involves more than just the provision of financial resources. An effective and sustainable technology transfer approach includes the integration of both soft and hard technologies. Too frequently, technology transfer efforts concentrate solely on installing hard technologies and hence do not provide sufficient soft technological capacity for these technologies to be successfully and widely adopted in the recipient countries.

35. In the case of renewable energy technologies, there is a lack of adequately trained experts and engineers as well as the absence of minimum norms and standards in the area of off-grid renewable rural electrification.

4. Economic barriers

36. Generally poor macroeconomic conditions, political corruption, and in some cases generally immature enabling environments are key economic barriers. Other economic barriers relate specifically to the situations faced by the many small countries in Latin America and the Caribbean. Small countries generally have small markets for climate technologies which tend to attract less attention from donors and the private sector.

37. The small market size for commercial renewable energy technologies in many individual countries of the Central American, South American and Caribbean countries limits bulk procurement of renewable energy technologies and services, effectively making these technologies economically unviable. Regional or subregional "pooling" of the resource base may help increase the market size for these technologies.

38. Various suggestions were made to overcome economic barriers including the encouragement of legal, institutional and policy reforms to facilitate technology transfer.

5. Lack of access to information

39. The lack of information throughout many of the critical stages of the process of technology transfer is a key barrier. These information gaps are frequently at the root of other significant barriers (e.g. lack of political support and awareness among all stakeholders, including the private sector and the public).

40. Several participants, particularly those from the private sector, identified a need to increase the flow of information about appropriate environmentally-sound technologies between

recipients/users and the suppliers of the technologies in developed countries. On the supply side it was suggested that 'one-stop' technology transfer shops could be established within Annex I countries. On the demand side, in-field information and demonstration centres are useful to test technologies.

6. Financial barriers

41. Financial reforms are widely needed to improve availability and accessibility of financing and allow for innovative financing schemes for ESTs in the region. Practical experience leads to the observation that finance tends to flow to large projects in large countries, bypassing attractive programmes in smaller countries.

42. Participants from Central America and the Caribbean were concerned that projects arising from carbon markets, or a framework for technology transfer projects, would be less likely to be undertaken in small countries than in larger developing countries in the region. In this regard, it was recognized that special consideration needs to be given to smaller countries with small markets for ESTs when decisions regarding a framework for technology transfer are taken.

43. In some cases, high initial capital costs and high bank interest rates have hindered technology diffusion and transfer (e.g. solar systems in Honduras). In other cases, conditions attached to concessionary loans are too restrictive.

E. Building capacity for the development and transfer of technology

44. The need to strengthen and build the requisite human, institutional and technical capacities of countries in the region was acknowledged by all participants. Depending on individual country or project circumstances, capacity-building is necessary at all stages in the process of technology transfer.

45. However, several participants noted that few, if any, countries in the region have undertaken a systematic identification of capacity-building needs.

46. A general lack of indigenous capacity to carry out research and development in the region was highlighted several times.

47. Throughout the workshop, various specific examples of capacities lacking or absent and in need of enhancing or developing were given. The need for training was noted many times, including to strengthen human resource capabilities to:

- Support policy analysis;
- Design and implement policy, regulatory and institutional reforms;
- Protect intellectual property;

- Assess, select, import, develop and adapt appropriate technologies;
- Undertake appropriate project identification, financing, design and packaging;
- Identify and monitor the secondary benefits to mitigation- and adaptation-related policies and measures (e.g. local environmental and health benefits).

48. Participants noted a range of institutions that need to be strengthened, including the management consulting sector, energy service companies, investment product rating organizations and legal service providers.

49. Other specific suggestions for areas where capacities need strengthening included:

- Technology demonstrations and pilot projects;
- Educational programmes on technology benefits and application;
- Technology testing, certification and labelling;
- Support targeted at the academic sector (universities and research institutes);
- Technical capacities in different areas – renewables, sinks and reservoirs, adaptation;
- Community participation in decision-making.
- Support to government offices in charge of international environmental protection matters.

50. A number of suggestions were made for ways in which various stakeholders could help strengthen capacities to facilitate the development and transfer of technologies, including:

- Greater coordination among, and use of, various existing mechanisms including bilateral assistance, multilateral efforts, regional organizations, the private sector, NGOs, academics and research institutes;
- The development of regional and South-South technology transfer activities;
- The enhancement or development of research and development programmes within developing countries, together with complementary policies to promote technology diffusion, combined with enhanced joint international research and development collaboration programmes (North-South and South-South);
- Awareness-raising within developed countries to discourage businesses from using restrictive business practices;

- The enhancement and establishment of demonstration centres, including in-field demonstration centres;

F. Outcome of the working groups: conclusions and suggested possible elements of a framework

51. The Chairman requested participants in the three working groups to share and discuss their ideas on possible elements of a framework for meaningful and effective actions to enhance the implementation of Article 4.5 of the Convention. Each working group addressed a similar set of issues and questions which were derived from the annex to decision 4.CP/4, the previous two regional workshops, and additional issues and questions raised during this workshop. Although the Chairman did not attempt to hold a debate or to reach agreement among participants on the appropriateness, practicability or acceptability of the ideas developed, each individual working group achieved a modest measure of consensus on the ideas and "elements" reported to the plenary.

52. The various suggestions presented below are derived from the reports of the three working groups and the discussions that followed the presentation of these reports to the plenary. Only new suggestions, building on those emerging from the Asia and the Pacific regional workshop, are listed here. The ideas regarding possible elements of a framework are grouped together under the following headings: suggestions for possible actions by all Parties; suggestions for possible actions by Annex II Parties; possible actions by non-Annex I Parties; suggestions for possible joint activities and partnerships; and suggestions for possible intergovernmental actions.

53. A framework for actions should clearly define the roles of governments and other key stakeholders in both developing and developed countries. The participants recognized that a successful framework will encourage the participation of all stakeholders in a continuing consultative process.

1. Suggestions for possible actions by all Parties

54. The working groups generated several ideas regarding possible actions which could be undertaken by all Parties to enhance the transfer of technologies. These potential actions included the following:

- Governments should consider implementing legal, institutional and policy reforms as they relate to the transfer of technology. Parties should consider actions to make the above-mentioned systems more transparent and efficient;

- There is a need for financial reforms to improve the availability and accessibility of capital and financing for technology projects. In developed countries, reform could include enhanced promotion of foreign direct investment whereas in developing countries, reforms could include promotion of access to financing for ESTs. In general,

the provision of increased financial support specifically to assist the development and transfer of ESTs to the region was noted as a key role for both developed and developing countries;

- Complex and overly bureaucratic procurement procedures are often cited as a significant barrier to private sector participation in technology projects in developing countries. Simplifying and streamlining these procedures would encourage greater private sector involvement in technology transfer projects which could result in higher quality and lower cost outcomes;

- The promotion of competitive globally oriented markets is fundamental to increasing flows of high quality technologies and information. However, care must be taken to ensure sustainable development goals are not compromised;

- There is a need to link national policy actions with global issues. For example, countries should consider policies to influence the business practices of multinational enterprises through policies and programmes to encourage these entities to apply best practice standards in all countries where they operate;

- Sustainable technology transfer requires the establishment of proper enabling environments which are defined by stable, clear and coherent market signals including the clear protection of intellectual property rights;

- Information exchange is important for facilitating the transfer of technology. Both developed and developing country Parties should encourage the open exchange of information on technology and technology-related activities. These information exchanges should also include information on adaptation technologies and on the social, environmental and human health impacts of climate technology programmes.

2. Suggestions for possible actions led by Annex II Parties

55. The working groups also suggested possible actions which could be undertaken by Annex II Parties to enhance the transfer of technologies to the region. These actions included the following:

- Develop and implement domestic programmes which discourage industries in Annex II countries from utilizing restrictive business practices. These efforts could also include reassessment of national development assistance programmes which promote tied aid;

- Enhance export credits and other instruments which provide incentives for the private sector to participate in the transfer of ESTs. These efforts should be targeted particularly at countries with low flows of foreign direct investment;

- Provide financial and technical assistance for developing countries to carry out needs assessments, including technology impact analysis, to identify and prioritize technology

needs and develop a portfolio of climate technology actions for mitigation and adaptation;

- Develop and implement domestic actions and incentives in Annex II countries to promote the transfer of ESTs by the private sector;

- Enhance or develop linkages between the climate technology related research and development communities and the official development assistance communities within donor countries with a view to delivering support more efficiently to developing countries. One avenue suggested would be to promote joint research and development activities with developing country counterpart institutions as a formal part of official development assistance;

- Make available information on financing sources for ESTs and provide assistance to developing countries in accessing these resources;

- Examine options to boost the effectiveness of the private sector as an important and successful delivery vehicle for transferring technology for mitigation technologies.

3. Possible actions led by non-Annex I Parties

56. The working groups also drew up a number of suggestions related to possible actions which could be undertaken by non-Annex I Parties to enhance the transfer of technologies to the region. These actions included the following:

- Identify and establish "focal points" to coordinate domestic technology transfer activities and actions related to the transfer of ESTs and develop a portfolio of climate technology actions (strategies) for mitigation and adaptation;

- Conduct technology needs assessments, including technology impact assessments, and ensure fair and equitable evaluation of local EST needs and of barriers to technology transfer by development and implementation of a transparent process with broad stakeholder consultation (government, business, technical institutions, NGOs). The outcome of these needs assessments should be a limited, prioritized set of technology needs and portfolio of climate technology actions;

- Build public awareness and support for development and adoption of ESTs through development of effective standards and labelling programmes, consumer education, as well as documentation of the social, environmental and human health related benefits of ESTs;

- Develop regional and South-South technology transfer initiatives;

- Enhance, develop and strengthen research and development programmes for ESTs and promote complementary policies for their diffusion;

- Develop the in-country enabling conditions and capacities to support, maintain and adopt technology transfer. These enabling conditions should also include the enhancement of physical and communication infrastructure;

- Integrate the reporting of technology transfer needs, including mitigation and adaptation technology transfer strategies, with national communications. Consider implementing a separate activity in coordination with development of national plans to routinely update the needs and strategies;

- Improve macroeconomic stability and maintain a stable legal structure to facilitate transfer of ESTs.

4. Suggestions for possible joint activities and partnerships

57. The working groups also formulated a number of suggestions related to activities that could be undertaken jointly or in partnership between developed and developing countries to enhance the transfer of technologies to the region. These actions included the following:

- Conduct joint research and development programmes through bilateral and multilateral research and development initiatives. Technology partnerships could be formed among institutions supporting research and development activities. These efforts could be focused on the development of priority indigenous technologies identified by the developing country needs assessments. Research and development activities could be conducted on these priority technologies jointly with the development of appropriate technologies and development of supporting human capacities, to successfully integrate these technologies into developing country markets;

- Develop technology demonstration centres, including in-field technology demonstrations, in developing countries. This idea was similar to the expressed need to develop or enhance cleaner production centres in the region and to link these centres with activities involving the transfer of technology under the UNFCCC;

- Form technology units in developing countries with technical and financial assistance of Annex II Parties. These units could conduct and coordinate technology transfer activities and actions in collaboration with similar units (one stop technology shops) established in the developed countries. Appropriate activities may include the following:

  - Conduct technology needs assessments to identify technology-related priorities;

  - Serve as focal points for stakeholder participation;

  - Conduct analysis of technology impacts;

  - Analyse anticipatory adaptation technologies and measures to promote their use;

- Plan, coordinate and implement a portfolio of priority climate technology actions for mitigation and adaptation;

- Coordinate project identification, financing, and design, including joint ventures and project implementation and management

- Develop, enhance and expand multilateral technology programmes, one example of which is the Cooperative Technology Implementation Plan (CTIP) programme of the Climate Technology Initiative. A multilateral technology programme could assist with coordinating donor responses to technology needs and develop a portfolio of priority climate technology actions for mitigation and adaptation. Further, this programme could assist with developing country needs assessments, identify technology priorities and actions, and build institutional and human capacity to facilitate sustainable transfer of technology;

- Strengthen regional and subregional integration activities, including technology activities of regional and subregional bodies and institutions. These institutions could serve as technology information centres and clearing houses and provide informational databases of regional technology needs and projects. Further, such existing bodies could become enhanced centres of excellence that could carry out technology-based training programmes;

- These centres could also be a focal point for networking between stakeholders, especially educational and research institutions, and information collection and dissemination to stakeholders for technology development

5. Suggestions for possible intergovernmental actions

58. The working groups also formulated a number of suggestions for intergovernmental actions. These actions included the following:

- Make better use of existing institutions for the transfer of technologies - UNDP, UNIDO, other multilateral institutions, bilateral institutions, etc.;

- Establish a process for multilateral coordination of donor assistance to target the priority needs of developing countries;

- Consider establishing a system to assist with the comparison of various ESTs. Such a system could include the development of performance ratings and technology performance standards;

59. Measuring the achievements of technology transfer actions was recognized as desirable, but it was clearly recognized that the development of specific indicators for gauging progress would require further study and work. However, voluntary industry reporting of project activities and best practices should be encouraged.

60. The working groups also suggested that the UNFCCC secretariat consider the formulation of GHG performance benchmarks for emerging hard technologies.

Annex

REPORT OF THE SECOND CLIMATE TECHNOLOGY INITIATIVE/INDUSTRY JOINT SEMINAR ON TECHNOLOGY DIFFUSION IN LATIN AMERICA AND THE CARIBBEAN

Background

1. The Climate Technology Initiative (CTI) is a multilateral activity on the part of 23 developed country Parties and the European Commission to support the objectives of the United Nations Framework Convention on Climate Change (UNFCCC) by facilitating the more rapid development and diffusion of climate-friendly technologies and practices. CTI pursues this mission through a variety of capacity-building and technology-enhancing functions, including regional joint industry seminars on technology diffusion. The first such seminar for the Latin America and the Caribbean region was held in San Salvador, El Salvador on 26-28 March 2000, in cooperation with the UNFCCC secretariat. This event, which attracted over 140 public and private sector participants from more than 40 countries and international organizations, was sponsored by Spain's Ministry of Industry and Energy, Japan's New Energy and Industrial Technology Development Organization, the United States Department of Energy, SwissContact, the United Nations Industrial Development Organization, the Shell Foundation Sustainable Energy Programme, and the Organization of American States.

2. The goal of this and the previous CTI seminars was to promote increased understanding of the regional-specific issues and barriers limiting the more rapid adoption of climate-friendly technologies and inform the UNFCCC consultative process on these outcomes. To accomplish this, the seminar was structured to provide for a free and open exchange of views among affected stakeholders from the region, with particular emphasis on input from the private sector. Topics on the agenda ranged from regional experiences with climate related projects to the critical issues of financing, capacity-building, and informational needs. Due to the relatively large number of participants and topics covered, a portion of the agenda included a series of three thematic workshops to give individuals a greater opportunity for discussion. These workshops were intended to share information and focus individually on renewable energy, energy efficiency, and transportation with the goal of identifying financial, institutional, information, and capacity barriers that exist, along with possible solutions.

3. Although the focus of the seminar was climate, it was readily acknowledged before and during the seminar that climate is subordinate to the near-term priorities of the region, which are more of a socio-economic nature; including alleviation of poverty, health, clean water, education, improved standard of living, etc. Thus, in the near term, the building of indigenous capacity necessary to assimilate and absorb contemporary climate-friendly technologies should be viewed, not as an end unto itself, but as a means to assist developing countries' in respecting their socio-economic priorities, which will in turn be complementary to their overall sustainable development goals.

Outcomes

4. Although there is clearly some overlap, for purposes of summarizing the outcomes of the seminar, the major areas of discussion have been grouped under five headings; (1) perspectives of technology transfer, (2) capacity-building needs, (3) information needs, (4) institutional needs, and (5) financing and project development considerations. This summary is not intended to be an all-inclusive transcript of what was said or even a general consensus on the issues discussed during the seminar. Instead, it is intended to represent a spectrum of observations and opinions expressed during the two-and-a-half day meeting.

Perspectives of technology transfer

5. From the opinions expressed, it was clear that participants were in general agreement that technology transfer included both "hard" and "soft" technologies in the sense of not only the hardware, but also the ability to maintain and repair the system over its useful life. The importance of the activity being economically viable in order to secure the long-term involvement of the private sector was expressed in a variety of ways. Additionally, the often heard theme that "one size does not fit all" was again stated in San Salvador, meaning that the technology selected must not only be technologically sound, but also environmentally-sound and consistent with the country and regional-specific circumstances. Several of the thoughts expressed were as follows:

- Sustainable projects need to have "three winners": the environment - sound science and technology approach, the local population - community involvement, indigenous capacity, and the commercial entity representing the project [or, in other words, to succeed, a technology must be both environmentally and economically viable and socially responsible.];

- Exercising creativity can help - integration of multiple technologies at a given site, such as wind and solar, can promote successful technology transfer; during periods of reduced wind, there may be greater solar intensity;

- Transfer of knowledge should form an essential part of the technology transfer "package";

- Private sector participation is essential to effective technology transfer;

- Social equity, in the sense of reducing the gap between rich and poor, should be a component of projects to transfer environmentally-sound technologies.

Capacity-building needs

6. It was acknowledged by many of the participants that a significant amount of internal capacity was being developed within various countries and that, in the near term, the building of such indigenous capacity necessary to assimilate and absorb contemporary climate-friendly

technologies should be viewed, not as an end unto itself, but as a means to assist developing countries in respecting their socio-economic priorities, which will in turn be complementary to their overall sustainable development goals. Further, participants noted that having such internal capacity provided direct benefits to the particular project activity in terms of both cost and reliability. Additional thoughts on capacity-building included:

- True capacity-building goes beyond past practices of installing "turn-key" projects. To be effective, it must involve helping to create local and regional infrastructure and know-how that integrates cultural values, technologies, capital stock, technical skills, regulatory mechanisms and financing so that it supports a sensible and readily accepted policy approach to achieving sustainable development;

- Developing indigenous capacity can lower the cost of projects and improve reliability;

- Training and technical guidance is an essential element for effective technology transfer.

Information needs

7. Access to high quality, relevant information is a problem to varying degrees for all Parties, but is particularly acute in developing countries relative to technology opportunities and options. Participants acknowledged that increased access to the Internet had been a great improvement regarding the availability of information per se. However, it had not solved the problem of gaining access to relevant, useful information. In this regard there was considerable discussion of how the CTI and other web sites had been attempting to overcome this problem by assisting users in making a more focused search of the multiple databases available, but further efforts were needed. Some of the other opinions expressed included the following:

- Provide greater awareness and understanding of technology options to respond to climate change, including those related to adaptation, agriculture, and land-use;

- Lack of information on efficient technologies and delivery channels can inhibit adoption of environmentally-sound technologies;

- Awareness of regulatory issues, performance contracting, energy service companies (ESCOs), financing schemes, and institutions can be more important than the information on the available hardware; i.e., knowing what your needs are and how those needs might be met is important, but such information is of little value if you cannot take the next step of actually acquiring the technology;

- Country-specific needs are a key consideration when assessing technology alternatives, and must be established in developing countries;

- There is no simple way to measure the effectiveness of technology transfer on an aggregate basis. Empirical data must be used to assess effectiveness of technology transfer in individual projects.

Institutional needs

8. Participants at the seminar recognized that government has a role to play in the overall process of technology transfer. There was a clear message that government is not always the dominant force, but in most cases can be more effective in the capacity of facilitator. By serving as facilitator, government can help by providing an enabling environment where all the affected stakeholders are encouraged to most effectively exploit their comparative advantage. For example, such an enabling environment will enhance: (1) investor confidence that their contractual right to repayment will be protected; (2) technology suppliers' confidence that their patents and other intellectual property rights will be respected; and (3) firms' confidence that currency and political risk will be manageable. Some of the thoughts expressed included the following:

- Government, as signatory to the UNFCCC, has a role to play in technology transfer, but can only do so much. On a case-by-case basis, the "right" balance must be found between public and private sector actions;

- Government can play an important role in areas where rates of return are less attractive to the private sector, such as investments in adaptation;

- Government can encourage investment in climate-friendly technologies through fiscal policy intervention and guarantees;

- Government intervention may be appropriate in some cases to accelerate adoption of environmentally-sound technologies and promote demand for a particular technology;

- Government and private sector partnerships can test and promote the adoption of appropriate technologies;

- Host country governments should provide for a stable business environment;

- Successful technology transfer most often occurs through engagement of all affected interests. This entails collaboration among government, community, and the private sector. Although all groups are important, without the private sector only limited technology transfer will occur;

- Privatized markets and deregulation can be a positive signal to both internal and external investors;

- A system of well-defined property rights is necessary to attract investment;

- A stable legal structure provides for continuity and encourages investment. Without such stability, firms are reluctant to participate, since political changes can rapidly alter the attractiveness of a previous investment;

- Legal reforms need to be tailored to country-specific circumstances. Just as with technologies, "one size does not fit all";

- Multilateral organizations can play a role in advancing the adoption of environmentally-sound technologies by helping to support intensified research and development to lower costs and support expanded training activities to establish indigenous capacity;

- To encourage its increased participation, business is looking to government, not to pick technology winners, but to: (1) reward voluntary action; (2) establish rules for emissions trading and the clean development mechanism; (3) clarify tax/title/transfer rules regarding certified emission reductions (CERs); (4) not abandon pilot projects, such as those undertaken under activities implemented jointly; and (5) level the playing field by removing subsidies and other market distortions.

Financing and project development considerations

9. Although the seminar had a specific session devoted to financing climate-related projects, the general topic of financing entered nearly every discussion, as it has at all previous regional CTI/industry joint seminars on technology diffusion. Participants indicated that climate was not absent from their project planning and development decisions, but that it was not a primary consideration. Understandably, the major impetus behind a given project was responding to growth and/or replacement requirements in various sectors of the economy. Several participants made the point that countries might benefit from collaboration with external sources on future technology needs. As part of this collaborative process, the various technology options available to meet the growth/replacement requirements in a particular sector could be identified along with their respective environmental advantages, including an assessment of the potential for obtaining financing.

10. Also, participants expressed significant interest in the potential for the clean development mechanism to endow some projects with an additional revenue stream from the sale of CERs. Such supplemental revenue could raise the effective rate of return, thereby turning a previously uneconomic project into a viable one. However, participants noted that many uncertainties exist which need to be clarified, including the rules under which CERs would be measured and the types of qualifying projects. Several participants indicated that once these rules were established, greenhouse gas (GHG) emission considerations would begin to play a much greater role in project development and financing decisions. One participant cautioned that, although the ultimate content of the rules was important, it was also important not to wait until all the rules were established, but instead to make progress and increase the level of understanding by continuing to account for the GHG aspects of projects. Some of the other thoughts expressed included the following:

- Besides the direct economic and environmental benefits associated with investment in environmentally-sound technologies and practices, such projects provide revenue to government and the local economy for infrastructure improvement;

- Project environmental considerations should be framed in the context of business so that meaningful comparisons can be made among competing technological approaches;

- Given that some of the multilateral banks, such as the International Finance Corporation of the World Bank, have comparatively high thresholds for non-recourse financing, smaller projects may require financial intermediaries. In this same context, one participant noted the critical need for private entrepreneurship;

- Lack of adequate venture capital in Latin America is limiting growth, particularly for climate-related projects;

- Environmental niche financing is emerging in such areas as forestry, renewables and ecotourism;

- A significant potential exists for utilization of biomass in both commercial and residential applications;

- Creative financing schemes can bridge gaps in providing energy to rural populations with limited resources;

- Regardless of how creative the financing scheme may be, sound basics still apply in the sense that minimum rates of return (hurdle rates) must be met and currency and political risks must always be managed.

Conclusion

11. Many of the messages conveyed at this regional seminar for Latin America and the Caribbean were fully consistent with those expressed at previous such gatherings for Asia, Eastern Europe and the countries of the former Soviet Union, and Africa. Although conveyed with varying degrees of emphasis, the sentiment in each of the regions was that addressing climate is subordinate to the near-term priorities of the region, which are more of a socio-economic nature. As such, in the near term, the building of indigenous capacity necessary to assimilate and absorb contemporary climate-friendly technologies is a means to assist developing countries in moving toward their socio-economic priorities while at the same time complementing their longer-term overall sustainable development goals.

12. Another recurring theme was that technology choices must be responsive to the country and regional circumstances in order to be sustainable. A variant on this theme of "one-size not fitting all" regarding technology was that institutional frameworks must also be responsive to the cultural and other unique aspects of a country or region.

13. Consistently, there was a clear need voiced for increased access to accurate and relevant information on available technology options, along with the indigenous capacity to absorb, assimilate, and analyse such information so that informed choices could be made. In this same

category was the need for countries to establish their technology needs and consider how external multilateral collaboration might assist in turning these needs into functional systems.

14. Probably the most consistent message related to the importance of countries taking the necessary steps to establish an enabling environment with its associated economic and political stability, which will encourage the essential participation of the private sector. Included in this latter theme was the importance of countries protecting intellectual property rights and providing general institutional stability to allow for long-term planning and commitment by internal and external investors.

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METHODOLOGICAL ISSUES

GUIDELINES UNDER ARTICLES 5, 7 AND 8 OF THE KYOTO PROTOCOL

Modalities for the accounting of assigned amounts

Preliminary assigned amounts

Note by the secretariat

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I. INTRODUCTION

1. The Kyoto Protocol stipulates that assigned amounts for the first commitment period shall be calculated in accordance with Article 3.7 and 3.8 and Annex B of the Kyoto Protocol. Additions to and subtractions from these assigned amounts may be made in accordance with Article 3.3, 3.4, 3.10, 3.11, 3.12 and 3.13 of the Kyoto Protocol.[1]

2. The provisional agenda and annotations for the twelfth session of the Subsidiary Body for Scientific and Technological Advice (SBSTA) contains an invitation to Parties to provide specific views on modalities for the accounting of assigned amounts under Article 7.4, in particular on the process of establishing initial assigned amounts (FCCC/SBSTA/2000/1, para. 38). The secretariat has prepared this document to provide information relevant to discussions on Articles 5, 6, 7, 8, 12 and 17 of the Kyoto Protocol.

3. In this document, the term "initial" assigned amount refers to the assigned amount calculated on the basis of Article 3.7 and 3.8 and Annex B without any additions or subtractions, in accordance with Article 3.3, 3.4, 3.10, 3.11, 3.12 and 3.13.[1]

II. BACKGROUND

4. The subsidiary bodies, at their tenth sessions, endorsed the work programme on methodological issues related to Articles 5, 7 and 8 of the Kyoto Protocol (FCCC/SB/1999/2). One of the tasks in this work programme (cluster D) addresses the issue of modalities for the accounting of assigned amounts under Article 7.4 of the Kyoto Protocol. In accordance with this work programme, the secretariat was requested to prepare a paper for the thirteenth session of the SBSTA on the implications of recalculations of greenhouse gas (GHG) inventories of the base and subsequent years on assigned amounts of Annex I Parties (FCCC/SB/1999/2, p.17).

5. A preliminary paper on this issue was made available at the workshop on issues related to Articles 5, 7 and 8 that was held in Bonn, 14-16 March 2000[2]. The information in this paper indicates that a change in the base year greenhouse gas emission estimates resulting from a recalculation of a previously submitted GHG inventory causes a similar change in the assigned amount. For 16 Parties, the changes in emission estimates between second national communications and inventories reported two years later range from -5.3 to 12.3 per cent. The average change was 3.9 per cent.

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[1] The secretariat is aware that Parties have introduced terms such as "initial", "recalculated", and "modified" assigned amount in their submissions. Parties may wish to consider whether these terms need to be defined and standardized.

[2] See working paper No. 6 "Effects of recalculations of greenhouse gas inventories on assigned amounts and on emission limitation and reduction commitments of Annex I Parties". This working paper may be obtained from the web site of the secretariat://www.unfccc.de/sessions/workshop/000314. Parties may also obtain the paper upon request.

6. Some Parties, in their submissions on Articles 5, 7 and 8 (FCCC/SBSTA/2000/MISC.1), included views on methodological and technical issues related to modalities for the accounting of assigned amounts, such as the establishment of initial assigned amounts, the relationship between inventory time-series and the assigned amounts if new inventory information becomes available, and rules for calculating the assigned amounts. Some of them expressed the need for additional analysis of these issues in order to find solutions at an early stage.

7. Participants at the above-mentioned workshop noted that base year emission inventories should be reviewed prior to the first commitment period, after which they may be fixed for the duration of the commitment period (FCCC/SBSTA/2000/INF.5, para. 23 (a)). It was, however, also noted that there could be circumstances in which recalculations of base year inventories may be allowed during the commitment period.

III. PRELIMINARY CALCULATION OF INITIAL ASSIGNED AMOUNTS

8. The table at the end of this document contains preliminary estimates of assigned amounts of Annex I Parties calculated in accordance with Article 3.7 and 3.8. The assigned amounts were calculated considering the six greenhouse gases included in Annex A to the Kyoto Protocol. **The estimates provided should be considered preliminary, since no Party has submitted a final base year inventory**. This information is provided for illustrative purposes only. For Parties that did not provide data on all greenhouse gases, the assigned amount was based only on gases that were reported. The last submitted inventory information was used for the calculations. The larger value of either the 1990 or 1995 aggregated emissions, expressed in carbon dioxide (CO_2) equivalent, was used for hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6). Also, actual emissions of these gases were used, unless a Party only reported potential emissions[3]. The footnotes to the table provide additional information on reporting issues that could influence the calculation of the assigned amounts of individual Parties.

IV. QUESTIONS NEEDING CONSIDERATION

9. The following list of preliminary questions may need to be addressed by Parties when considering the development of modalities for the accounting of assigned amounts under Article 7.4:

(a) Is the use of the term "initial" assigned amount appropriate?

(b) Should assigned amounts be "fixed" before the first commitment period? If so, when?

(c) What process should be used to "fix" assigned amounts?

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[3] The ratio of potential to actual emissions for HFCs may vary widely among Parties. For example, it ranges from 16:1 to 1.9:1 among the three Parties which reported both emissions in their second national communications. This ratio may also exist for PFCs and SF_6. The magnitude of this ratio depends on the national circumstances of the use of these gases.

(d) What should be done when a Party has recalculated subsequent years but has not recalculated its base year, as requested by the UNFCCC reporting guidelines on annual inventories (decision 3/CP.5)?[4]

(e) Should the base year inventory be reviewed prior to "fixing" the assigned amount? If so, when?

(f) Should adjustments under Article 5.2 be applied to the base year? If so, when? Should these adjustments be considered in the process of "fixing" the assigned amounts?

(g) If the assigned amount is "fixed", should recalculations of the base year be allowed during the first commitment period?

(h) May Parties choose different base years (1990 or 1995) for each specific GHG (HFCs, PFCs and SF_6) or only a common base year for these three gases? and

(i) How should potential emissions of HFCs, PFCs and SF_6 be considered when establishing initial assigned amounts[5]?

V. POSSIBLE ACTION BY THE SBSTA

10. The SBSTA may wish to consider the information provided in this paper, develop a process for addressing the questions identified in the previous sections, and determine whether some aspects require a decision by the Conference of the Parties (COP)[6] related to the modalities for the accounting of assigned amounts under Article 7.4. The SBSTA may wish to develop guidance on how to proceed with the work on modalities for the accounting of assigned amounts, including:

(a) A possible process for fixing the initial assigned amounts, that includes:

(i) The development of a procedure to define and notify the COP, through the secretariat, of the base year to be used for HFCs, PFCs and SF_6 in accordance with the provisions of Article 3.8;

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[4] See document FCCC/CP/1999/7.

[5] If the assigned amount is calculated and fixed using potential emissions, it will change when Parties provide actual emissions.

[6] For the purpose of this paper, the secretariat assumes that the COP may take decisions that would be recommended for further adoption by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol. Parties may decide upon other approaches.

(ii) The development of a process by which Annex I Parties with economies in transition would inform the COP, if they have not already done so, of their intention to use a historical base year or period other than 1990 for the implementation of their commitments under Article 3 in accordance with the provisions of Article 3.5; and

(b) A process to review[7] the base year inventories.

It may also wish to provide guidance to the secretariat related to the future work on these issues.

11. The SBSTA may also wish to consider the timing of any decision that may need to be taken by the COP. The work related to the mechanisms of the Kyoto Protocol should also be taken into consideration.

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[7] The secretariat assumes that this process will be conducted together with other review activities under the Convention and the Protocol.

Preliminary examples of assigned amounts

Party	Base year	Base year HFCs/PFCs/ SF_6 [a, b]	Gases not considered in the base year because not reported	Total GHG in base year ($Gg-CO_2$ equivalent)	Preliminary assigned amount ($Gg-CO_2$ equivalent)
Australia[c]	1990	1990	HFCs, SF_6	480,669	2,643,682
Austria	1990	1995	-	77,154	354,908
Belgium	1990	1995	PFCs	137,034	630,356
Bulgaria	1988	data not available	HFCs, PFCs, SF_6	157,090	722,613
Canada	1990	1990	-	599,450	2,817,415
Czech Republic[d]	1990	data not available	HFCs, PFCs, SF_6	189,837	873,248
Denmark	1990	1995	-	69,952	321,781
Estonia[c]	1990	data not available	HFCs, PFCs, SF_6	40,719	187,307
Finland	1990	1990	-	75,201	345,927
France	1990	1990	-	553,781	2,547,394
Germany	1990	1995	-	1,212,075	5,575,545
Greece	1990	1995	-	107,560	494,777
Hungary[c]	1985-1987[f]	data not available	HFCs, PFCs, SF_6	101,634	477,678
Iceland[g]	1990	1995	HFCs, PFCs	2,576	14,170
Ireland	1990	data not available	HFCs, PFCs, SF_6	53,497	246,086
Italy	1990	1995	-	519,540	2,389,884
Japan[g]	1990	1995	HFCs, PFCs	1,227,602	5,769,730
Latvia	1990	data not available	HFCs, PFCs, SF_6	35,669	164,076
Liechtenstein	1990	data not available	HFCs, PFCs, SF_6	260	1,196
Lithuania[c, e]	1990	data not available	HFCs, PFCs, SF_6	51,548	237,123
Luxembourg	1990	data not available	HFCs, PFCs, SF_6	13,448	61,862
Monaco[h]	1990	data not available	HFCs, PFCs, SF_6	111	509
Netherlands	1990	1995	-	219,206	1,008,349
New Zealand	1990	1990	-	73,066	365,332
Norway	1990	1990	-	52,141	263,312
Poland[d, e]	1988	data not available	HFCs, PFCs, SF_6	564,286	2,652,144
Portugal	1990	1995	HFCs	64,016	294,473

Party	Base year	Base year HFCs/PFCs/ SF_6 [a, b]	Gases not considered in the base year because not reported	Total GHG in base year ($Gg-CO_2$ equivalent)	Preliminary assigned amount ($Gg-CO_2$ equivalent)
Romania	1989	data not available	HFCs, PFCs, SF_6	264,879	1,218,444
Russian Federation	1990	1990	SF_6	3,040,062	15,200,310
Slovakia	1990	1990	-	76,304	351,000
Slovenia[c]	1986	data not available	HFCs, PFCs, SF_6	19,212	88,377
Spain	1990	1995	-	308,459	1,418,911
Sweden[g]	1990	1995	HFC, PFC	70,761	325,502
Switzerland[d]	1990	data not available	HFCs, PFCs, SF_6	53,005	243,824
Ukraine	1990	data not available	HFCs, PFCs, SF_6	919,220	4,596,100
United Kingdom[c]	1990	1995	-	765,728	3,522,351
United States of America	1990	1995	-	6,069,729	28,224,239

[a] All estimates of HFCs, PFCs and SF_6 refer to actual emissions except for Japan and Sweden, SF_6 emissions from the Netherlands and HFC emissions from New Zealand.

[b] The base year for HFCs, PFCs and SF_6 in this table is indicated solely on the basis of whether 1990 or 1995 levels of emissions were higher, with the higher value chosen as the base year. It should be noted, however, that some Parties in recent inventory submissions have indicated that they have not taken a decision as to the base year they will use.

[c] Emissions by sources minus removals by sinks from the land-use change and forestry sector were considered in the calculation of the assigned amounts in accordance with Article 3.7, due to the fact that for Australia and the United Kingdom land-use change and forestry constituted a net source of greenhouse gas emissions in its base year. Estonia and Lithuania reported net sources of greenhouse gas emissions from land-use change and forestry in 1997 and 1995-1997 respectively, but not in the base year.

[d] Although no information on emissions of HFCs, PFCs and SF_6 was provided for 1990 or 1995, the Party provided emission estimates for 1997 and/or 1998 in recent submissions.

[e] In inventory submissions or national communications subsequent to its first national communication, the Party has not provided revised estimates for the base year. It may be possible that the base year was not recalculated, but the subsequent years were.

[f] Average of years 1985, 1986 and 1987.

[g] The Party did not provide information as to the chemical species of HFCs and PFCs or information in terms of CO_2 equivalent, therefore these gases could not be considered in the assessment of the assigned amount.

[h] The Party reported emissions of HFCs, PFCs and SF_6 as negligible.

[i] 1990 data were used to calculate the assigned amount as the Party did not provide data for the base year.

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METHODOLOGICAL ISSUES

GUIDELINES UNDER ARTICLES 5, 7 AND 8 OF THE KYOTO PROTOCOL

Modalities for the accounting of assigned amounts

Preliminary assigned amounts

Note by the secretariat

Addendum

Possible implications of activities under Article 3.3 and proposed activities under Article 3.4 of the Kyoto Protocol on assigned amounts

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I. INTRODUCTION

1. The Kyoto Protocol stipulates that assigned amounts for the first commitment perio shall be calculated in accordance with Article 3.7 and 3.8 and Annex B of the Kyoto Protoc The Protocol also states, in Article 7.4, that the Conference of the Parties serving as the me of the Parties to the Protocol (COP/MOP) shall, prior to the first commitment period, decid upon modalities for the accounting of assigned amounts. Additions to and subtractions fro these assigned amounts may be made in accordance with Article 3.3, 3.4, 3.10, 3.11, 3.12 and 3.13.

2. At its eleventh session, the Subsidiary Body for Scientific and Technological Advic (SBSTA) requested Parties to provide submissions on land-use, land-use change and forestr 1 August 2000 with views on, or proposals for, *inter alia*, definitions under Article 3.3,[2] an indicate how and which human-induced activities will be included under Article 3.4.[3] Parti included in Annex I to the Convention (Annex I Parties) should further include, *inter alia*, a of additional activities that each individual Party is proposing for inclusion under Article 3. Annex I Parties were further requested to provide an assessment of net changes in carbon st and changes in emissions by sources and removals by sinks, associated with the activities u Article 3.3. and 3.4 (FCCC/SBSTA/1999/14, para. 46 (g), (h) and (i)). In response to this request, the secretariat prepared a consolidated synthesis of proposals (FCCC/SBSTA/2000 and a compilation of country-specific data and information (FCCC/SBSTA/2000/9/Add.1).[4]

3. For the twelfth session of the SBSTA, the secretariat prepared a paper on "Modalitie the accounting of assigned amounts - Preliminary assigned amounts" (FCCC/SBSTA/2000/INF.7) to provide information relevant to the discussions on Articles 7, 8, 12 and 17. In that paper, the term "initial" assigned amount was used to refer to the assigned amount calculated on the basis of Article 3.7 and 3.8 and Annex B without any

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[1] All articles referred to in this paper are those of the Kyoto Protocol. For the sake of brevity, the Kyoto Pr is not specified after each article.

[2] Article 3.3 states: The net changes in greenhouse gas emissions by sources and removals by sinks resultin from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation and deforestation since 1990, measured as verifiable changes in carbon stocks in each commitment period, shall be to meet the commitments under this Article of each Party included in Annex I. The greenhouse gas emissions sources and removals by sinks associated with those activities shall be reported in a transparent and verifiable manner and reviewed in accordance with Articles 7 and 8.

[3] Article 3.4 states: Prior to the first session of the Conference of the Parties serving as the meeting of the P to this Protocol, each Party included in Annex I shall provide, for consideration by the Subsidiary Body for Scientific and Technological Advice, data to establish its level of carbon stocks in 1990 and to enable an estim be made of its changes in carbon stocks in subsequent years. The Conference of the Parties serving as the mee of the Parties to this Protocol shall, at its first session or as soon as practicable thereafter, decide upon modaliti rules and guidelines as to how, and which, additional human-induced activities related to changes in greenhous emissions by sources and removals by sinks in the agricultural soils and the land-use change and forestry categ shall be added to, or subtracted from, the assigned amounts for Parties included in Annex I, taking into account uncertainties, transparency in reporting, verifiability, the methodological work of the Intergovernmental Panel Climate Change, the advice provided by the Subsidiary Body for Scientific and Technological Advice in accor with Article 5 and the decisions of the Conference of the Parties. Such a decision shall apply in the second and subsequent commitment periods. A Party may choose to apply such a decision on these additional human-indu activities for its first commitment period, provided that these activities have taken place since 1990.

[4] These documents were prepared on the basis of submissions from Parties that are compiled in documents FCCC/SBSTA/2000/MISC.6, Add.1 and Add.2.

additions or subtractions, in accordance with Article 3.3, 3.4, 3.10, 3.11, 3.12 and 3.13. That paper included examples of preliminary initial assigned amounts based on base year inventory data reported by Parties in their latest annual greenhouse gas (GHG) inventory submissions or national communications. The term "preliminary" reflects the preliminary nature of these calculations of assigned amounts.[5]

II. APPROACH

4. The aim of this paper is to provide additional preliminary information on the possible implications of different land-use, land-use change and forestry activities under Article 3.3 and 3.4 on the assigned amounts of Parties. Data in this paper are those reported by Parties in FCCC/SBSTA/2000/MISC.6 and Add.1 on projected changes in carbon stocks[6] resulting from alternative definitions of afforestation, reforestation and deforestation under Article 3.3 and possible activities under Article 3.4 for the first commitment period.[7] Data on preliminary initial assigned amounts are as provided in document FCCC/SBSTA/2000/INF.7.[8]

5. This paper, through tables 1 and 2 and their respective notes, shows the possible impact that individual activities under Article 3.3 and possible activities under Article 3.4 could have on assigned amounts. As the projected changes in carbon stocks from these activities for the first commitment period may depend on the definitions (IPCC, FAO or other) and accounting frameworks (land-based, activity-based)[9] used, the impact on the assigned amount of the activities under Article 3.3 corresponding to afforestation, reforestation and deforestation (ARD) and Article 3.4 activities was calculated individually following the various proposals as reported by Parties (see table 1).

6. The secretariat has not added the data on carbon stock changes resulting from afforestation, reforestation and deforestation, and those from proposed activities under Article 3.4 since different definitions and accounting frameworks could lead to different results and only compatible definitions and accounting frameworks can be combined. Therefore, the overall impact of total carbon stock changes from all the activities under Article 3.3 and possible activities under Article 3.4 on the assigned amount is not given in this paper. However, some Parties, in their submissions, provided estimates of total carbon stock changes for the activities under Article 3.3, namely afforestation, reforestation and deforestation, according to the different

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[5] Article 7.4 states that COP/MOP shall, prior to the first commitment period, decide upon modalities for the accounting of assigned amounts. As this decision has not been taken yet, the calculations of assigned amounts have a preliminary character.

[6] For the sake of comparability with assigned amounts that are expressed in terms of CO_2 equivalent, the secretariat converted all data on carbon stock changes (given in terms of carbon) into CO_2 by multiplying by 44/12.

[7] The full information provided by Parties on the data related to Article 3.3 and 3.4 activities can be found in documents FCCC/SBSTA/2000/MISC.6 and Add.1.

[8] Although since document FCCC/SBSTA/2000/INF.7 was issued, many Parties have provided an updated base year inventory in their latest annual GHG inventory submission, this addendum uses preliminary assigned amounts as presented in that document, for the sake of consistency.

[9] Explanations related to definitional scenarios and carbon accounting frameworks are provided in the IPCC *Special Report on Land-use, Land-use change and Forestry*, chapter 3.

definitions and accounting frameworks. For these Parties, the overall impact of these to estimates on the assigned amount is provided as examples in table 2.[10]

7. The data and information submitted by Parties in their submissions, and the data presented in this paper, by no means prejudge decisions or conclusions that may be made either the Conference of the Parties (COP) or the SBSTA at future sessions.

III. POSSIBLE ACTION BY THE SBSTA

8. The SBSTA may wish to note the information provided in this paper, particularly consideration of Articles 3.3, 3.4, 5, 6, 7, 8, 12 and 17 of the Kyoto Protocol.

IV. TABLES ON POSSIBLE IMPLICATIONS OF ARTICLE 3.3 AND PROPO ARTICLE 3.4 ACTIVITIES ON PRELIMINARY INITIAL ASSIGNED AMOU

[10] It should be noted that any estimates of total carbon stock changes from ARD activities according to different possible definitions and accounting frameworks should be calculated for each definition and acco framework used in a consistent manner across Parties.

Table 1. Possible implications of afforestation, reforestation and deforestation activities under Article 3.3 and proposed activities under Article 3.4 on preliminary initial assigned amounts in the first commitment period

Party	Activities under Article 3.3								Activities under Article 3.4				Preliminary initial assigned amount (AAU)[2]
	Afforestation (IPCC/FAO)[3]			Reforestation (FAO)			Deforestation (IPCC/FAO)						
	Accounting framework	$\Delta CO_{2,ce}$[1]	Impact on AA	Accounting framework	$\Delta CO_{2,ce}$[1]	Impact on AA	Accounting framework	$\Delta CO_{2,ce}$	Impact on AA	Accounting framework	type[4]	$\Delta CO_{2,ce}$[1]	Impact on AA	
		Gg CO_2	Per cent		Gg CO_2	Per cent		Gg CO_2	Per cent			Gg CO_2	Per cent	Gg CO_2eq
Australia	LB	56 533	3.3				LB	-211 200	-5.0	LB	1	39 989	1.5	2 643 682
Austria	AB[5]	6 882	1.9	AB	5 995	1.7	AB	-18 633	-5.0					354 908
	AB[5] (IPCC net)[6]	3 219	0.9	LB I	-23 230	-6.5								
				LB II	-422	-0.1								
Canada	AB/LB	- 1 833	-0.1	AB	-11 000	-0.4	AB/LB	-80 667	-2.9	LB	1	176 000	6.2	2 837 415
				LB I	-829 667	-29.4				LB	2a	11 286	0.4	
				LB II	-421 667	-15.0				LB	2b	47 993	1.7	
										LB	2c	75 086	2.7	
										LB	3a	7 601	0.3	
										LB	3b	25 854	0.9	
										LB	4a	1 467	0.1	
										LB	4b	2 200	0.1	
Denmark	AB/LB	1 738	0.5	AB	1 104	0.3								321 781
				LB I	-2 453	-0.8								
				LB II	-678	-0.2								
Finland	AB	2 237	0.6	AB	51 335	14.8	AB 1)[7]	-5 867	-1.7	LB	1	40 333	11.7	346 937
							AB 2)[7]	-8 800	-2.5					
France	AB - artificial	9 203	0.4	AB - artificial	30 433	1.2	AB	-20 625	-0.8	LB	R	139 518[8]	5.5	2 547 398
	AB - natural	56 368	2.2	AB - natural	14 168	0.6				LB	1	3 251[8]	0.1	
										LB	2	15 293[8]	0.6	
										LB	3	28 995[8]	1.1	
										AR	4	1 966[8]	0.1	
Germany	AB	1 967	0.1	AB	24 255	0.4	AB	-3 199	-0.1	LB	1	157 667	2.8	8 378 949
				LB I	-83 409	-1.5	AB (incl soil carbon)	-7 861	-0.1					
				LB II	-18 327	-0.3								
				AB (FAO 11)	40 425	0.7								
				LB I (FAO 11)	-139 014	-2.5								
				LB II (FAO 11)	-30 651	-0.5								
Iceland	LB	440	3.1							LB	1	9031	6.8	38 170

Table 1 *(continued)*

Party	Activities under Article 3.3									Activities under Article 3.4				Preliminary initial assigned amount (AA)[a]
	Afforestation (IPCC/FAO)[b]			Reforestation (FAO)			Deforestation (IPCC/FAO)							
	Accounting framework	ΔCO_{2CP}[c] Gg CO_2	Impact on AA Per cent	Accounting framework	ΔCO_{2CP}[c] Gg CO_2	Impact on AA Per cent	Accounting framework	ΔCO_{2CP}[c] Gg CO_2	Impact on AA Per cent	Accounting framework	Type[d]	ΔCO_{2CP}[c] Gg CO_2	Impact on AA Per cent	Gg CO_2 eq.
Ireland	AB/LB	16 768	6.8	AB	8 481	3.4								246 086
				LB I	-1 265	-0.5								
				LB II	-730	-0.3								
Italy	AB/LB	8 672	0.4							AB	2	20 321[h]	0.9	2 389 884
Japan	AB	5 016	0.1	AB	33 374	0.6	AB	-18 715	-0.3	AB	1a	208 413	3.6	5 769 730
										AB	1b	179 476	3.1	
										AB	2	1 386	0.0	
Netherlands	AB/LB	282 to 1 531	0.0 to 0.2	AB	763	0.1	AB	-242	0.0	LB/AB	1	565	0.1	1 008 349
				LB I	-1 716	-0.2	LB	-238	0.0	LB/AB	2	231	0.0	
				LB II	-477	0.0				LB/AB	3	-13 501	-1.3	
New Zealand[i]	LB	141 460	38.7											365 332
Norway	AB	917	0.3	AB	1 100	0.4	AB	-587	-0.2	AB	1	2 658	1.0	263 312
				LB I	-32 633	-12.4								
				LB II	-12 833	-4.9								
Sweden	AB/LB	3 117	1.0	AB	55 000	16.9		-4 767	-1.5	LB	1	82 500	25.3	325 502
										LB	2	1 100	0.3	
Switzerland	AB	61	0.0				AB/LB[j]	-257	-0.1	LB	1	5 317	2.2	243 824
										LB	2	106	0.0	
										LB	3	95	0.0	
										AB	5	807	0.3	
United Kingdom	LB	11 257	0.3	AB	8 474	0.2	LB	-964	0.0	LB	1	44 917	1.3	3 522 351
	LB[k]	10 699	0.3	LB I	-26 061	-0.7				LB	2	4 583	0.1	
				LB II	827	0.0								
United States of America	LB	737 000	2.6	AB	3 072 667	10.9	LB	-869 000	-3.1	LB	1	5 287 333	18.7	28 224 239
				LB I	-135 667	-0.5				LB	2	286 000	1.0	
				LB II	1 661 000	5.9				LB	3	150 333	0.5	

Notes:

This table only includes activities for those Parties for which numerical information on projected carbon stock changes over the first commitment period (ΔC_{CP}) was available. For the sake of comparability with preliminary initial assigned amounts that are expressed in terms of CO_2 equivalent, the secretariat converted all values of carbon stock changes (ΔC_{CP} in Gg C) into CO_2 (Gg) by multiplying by 44/12. Results of this multiplication indicate projected change in net CO_2 emissions or removals ($\Delta CO_{2\ CP}$) over the first commitment period resulting from the activities under Article 3.3. and 3.4. The impact (in per cent) of each activity on a Party's preliminary initial assigned amount was calculated as follows:
$\Delta CO_{2\ CP}$ / preliminary initial assigned amount *100.

A positive sign in the projected change in net CO_2 emissions or removals ($\Delta CO_{2\ CP}$) indicates either removals by sinks or an increase in carbon stocks. A negative sign indicates either emissions by sources or a decrease in carbon stocks. A positive impact on preliminary initial assigned amounts (in per cent) indicates that assigned amounts could potentially be increased, while a negative impact (in per cent) indicates that they could potentially be decreased.

For further details on the information related to ARD under Article 3.3 and Article 3.4 activities presented in this table, please refer to document FCCC/SBSTA/2000/9/Add.1, tables 2.a and 4.a and their corresponding footnotes, as well as to the submissions from Parties (FCCC/SBSTA/2000/MISC.6 and Add.1).

[a] Values given in this column represent preliminary examples of initial assigned amounts as per FCCC/SBSTA/2000/INF.7.

[b] Use of the IPCC definition was indicated by Australia, Iceland, New Zealand and Sweden. Japan indicated use of the FAO definition. The rest of the Parties considered both definitions.

[c] $\Delta CO_{2\ CP}$: Projected change in net CO_2 emissions or removals (Gg CO_2) over the first commitment period. Values for activities under Article 3.3 were based on projected carbon stock changes (ΔC_{CP} in Gg C) over the first commitment period on land afforested, reforested and deforested since 1990 up to 2012. For activities under Article 3.4, $\Delta CO_{2\ CP}$ values were calculated based on projected carbon stock changes (ΔC_{CP} in Gg C) over the first commitment period related to the Article 3.4 activity since 1990. In both cases, ΔC_{CP} values were used as presented in document FCCC/SBSTA/2000/9/Add.1 (table 2.a and 4.a, for activities under Article 3.3 and 3.4, respectively) and converted into CO_2 by multiplying by 44/12. It should be noted that methane (CH_4) and nitrous oxide (N_2O) emissions resulting from Article 3.4 activities were not considered in the calculations of $\Delta CO_{2\ CP}$.

[d] The numbers refer to activities as given in table 4.a of document FCCC/SBSTA/2000/9/Add.1. Activities for which numerical data for ΔC_{CP} have been provided by Parties are as follows: **Australia:** 1. Revegetation; **Canada:** 1. Forest management; 2. Cropland management (a: low adoption, b: medium adoption, c: high adoption); 3. Grazing land management and livestock (a: low adoption, b: medium adoption); 4. Shelterbelts (a: low adoption, b: high adoption) – The low, medium and high range of the estimates provided reflect different adoption rates of sink-enhancing practices-; **Finland:** 1. Forest management (including forest conservation); **France:** R. Reference; 1. Forest management in state forests; 2. Forest management in other public forests; 3. Forest management in private forests; 4. Conversion of mixed coppice/high forest stands into high forests; **Germany:** 1. Forest management; **Iceland:** 1. Revegetation; **Italy:** 2. Conversion of grazing lands to forest; **Japan:** 1. Forest management; 1.a. all forests; 1.b. managed forests; 2. Urban greening; **Netherlands:** 1. Forest management; 2. Cropland management; 3. Grazing land management; **Norway:** 1. Fertilization; **Sweden:** 1. Forest management; 2. Forest conservation; **Switzerland:** 1. Establishment of carbon forests and forest reserves to increase carbon stock; 2. Cropland management; 3. Cropland conversion to grassland; 5. Increased use of wood products and other long term wood materials; **UK:** 1. Forest management; 2. Bioenergy crops; **USA:** 1. Forest management; 2. Cropland management; 3. Grazing land management.

[e] For the land-based accounting framework it was reported that figures would be approximately the same as the corresponding afforestation and reforestation figures for "IPCC, activity-based" and "IPCC net, activity-based", respectively.

[f] IPCC definitions for ARD are used. However, the afforestation and reforestation areas were reduced by the deforestation area.

[g] Option 1: Area information 1990-1998 is registered by Statistics Finland; from 2000 onwards, projected deforestation rate is 10,000 ha/a; Option 2: Estimates are based on the previous Finnish National Forest Inventory, provided that previous deforestation rate of 15,000 ha/a would continue.

[h] France, Iceland and Italy have not provided any estimates for ΔC_{CP} in their submissions, but reported the corresponding projected changes in net CO_2 emissions or removals ($CO_{2, CP}$). For these Parties, values in this col are as provided in their submissions.

[i] This table presents the total of afforestation and reforestation activities, which include grassland to planted fore shrublands to planted forest and grassland to shrublands or forest.

[j] A land use/flexible scenario has also been reported. Under this scenario the deforestation value was reported t the same as under the IPCC and FAO definitions.

[k] The United Kingdom has also provided data for afforestation using another definition in addition to the IPCC FAO definitions ("Other") which was defined as "net approach".

Table 2. Possible implications of total afforestation, reforestation and deforestation activities under Article 3.3 on preliminary initial assigned amounts in the first commitment period

Table 2.a. **Austria**
Preliminary initial assigned amount (AA):
354 908 Gg CO_2 eq.

Approach	ARD total Gg CO_2	Impact on AA Per cent
IPCC	-3 751	-1.1
FAO - AB	2 244	0.6
FAO - LB I	-26 987	-7.6
FAO - LB II	-4 173	-1.2
IPCC net	3 219	0.9

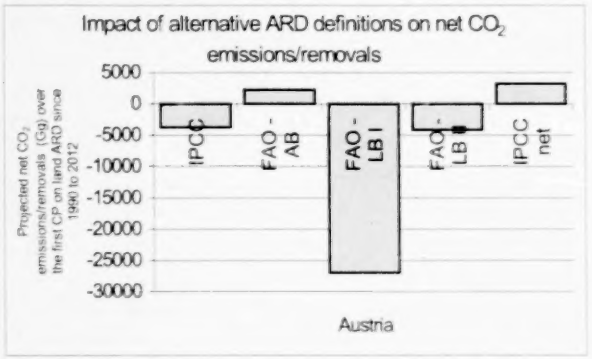


Table 2.b. **Denmark**
Preliminary initial assigned amount (AA):
321 781 Gg CO_2 eq.

Approach	ARD total Gg CO_2	Impact on AA Per cent
IPCC - AB	1 738	0.5
IPCC - LB	1 738	0.5
FAO - AB	2 842	0.9
FAO - LB I	-715	-0.2
FAO - LB II	1 060	0.3

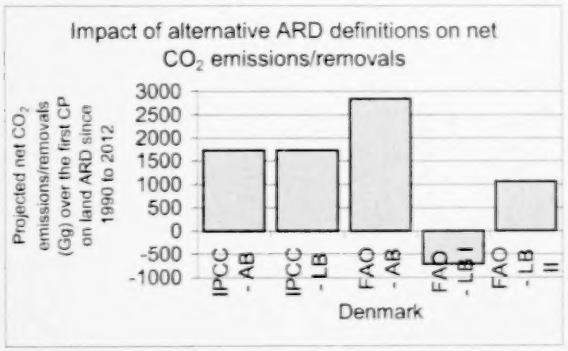


Table 2.c. **France**
Preliminary initial assigned amount (AA):
2 547 394 Gg CO_2 eq.

Approach	ARD total Gg CO_2	Impact on AA Per cent
IPCC (AR artificial)	-11 422	-0.4
IPCC (AR total)	44 946	1.8
FAO (AR artificial)	19 012	0.7
FAO (AR total)	89 551	3.5

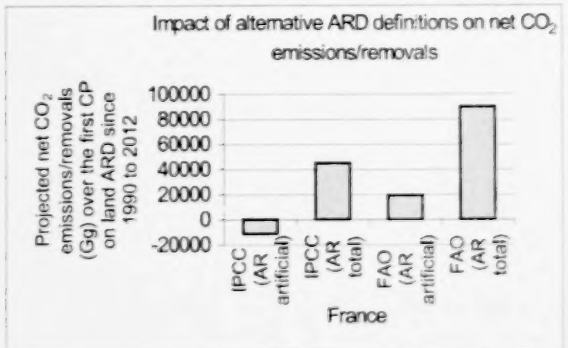


Table 2.d. **Netherlands**
Preliminary initial assigned amount (AA):
1 008 349 Gg CO_2 eq.

Approach	ARD total Gg CO_2	Impact on AA Per cent
IPCC - AB	39	0.00
IPCC - LB	43	0.00
FAO - AB	802	0.08
FAO - LB I	-1 673	-0.17
FAO - LB II	-438	-0.04

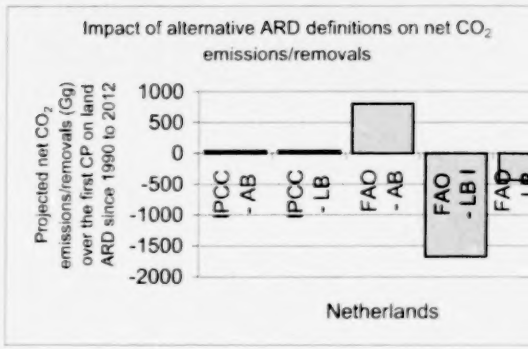


Table 2.e. **Norway**
Preliminary initial assigned amount (AA):
263 312 Gg CO_2 eq

Approach	ARD total Gg CO_2	Impact on AA Per cent
IPCC - AB	330	0.1
FAO - AB	1 467	0.6
FAO - LB I	-32 267	-12.3
FAO - LB II	-12 467	-4.7

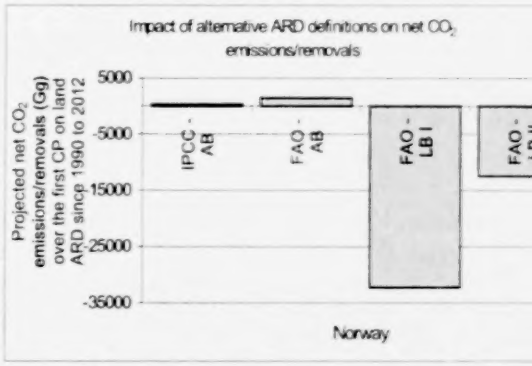
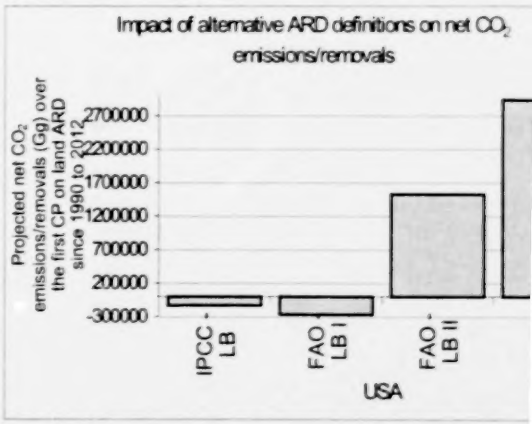


Table 2.f. **United States of America:**
Preliminary initial assigned amount (AA):
28 224 239 Gg CO_2 eq.

Approach	ARD total Gg CO_2	Impact on AA Per cent
IPCC - LB	-132 000	-0.5
FAO - AB	2 940 667	10.4
FAO - LB I	-267 667	-0.9
FAO - LB II	1 529 000	5.4



Notes:

Only Parties that provided estimates of total carbon stock changes due to afforestation, reforestation and deforestation activities for the first commitment period (ΔC_{CP}) are included in these tables.

Total projected changes in net CO_2 emissions or removals resulting from afforestation, reforestation and deforestation, referred to in table 2 as ARD total, are calculated by multiplying the projected carbon stock change over the first commitment period (ΔC_{CP}) by 44/12. The impact that total ARD activities according to the different definitions and accounting frameworks may have on preliminary initial assigned amounts are calculated as follows: ARD total / preliminary initial assigned amount *100 (see table1).

A positive sign in the ARD total indicates either removals by sinks or an increase in carbon stocks. A negative sign indicates either emissions by sources or a decrease in carbon stocks. A positive impact on preliminary initial assigned amounts (in per cent) indicates that assigned amounts could potentially be increased, while a negative impact (in per cent) indicates that they could potentially be decreased.

Each table is accompanied by a figure that illustrates the total projected change in net CO_2 emissions or removals over the first commitment period on land afforested, reforested and deforested since 1990 to 2012 according to the different definitions and accounting frameworks used.

The following abbreviations, symbols and units have been used in tables 1 and 2:

AB	Activity-based
ARD	Afforestation, reforestation, deforestation
C	Carbon
CO_2	Carbon dioxide
CO_2 eq.	CO_2 equivalent
CP	Commitment period (2008-2012)
Gg	Gigagram (10^9 grams)
LB	Land based (LB I - Land based I; LB II - Land based II)

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